

PLANAR SUBSTRATE WITH SELECTED SEMICONDUCTOR CRYSTAL  
ORIENTATIONS FORMED BY LOCALIZED AMORPHIZATION AND  
RECRYSTALLIZATION OF STACKED TEMPLATE LAYERS

ABSTRACT OF DISCLOSURE

A method utilizing localized amorphization and recrystallization of stacked template layers is provided for making a planar substrate having semiconductor layers of different crystallographic orientations. Also provided are hybrid-orientation semiconductor substrate structures built with the methods of the invention, as well as such structures integrated with various CMOS circuits comprising at least two semiconductor devices disposed on different surface orientations for enhanced device performance.